



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/781,795

02/20/2004

Yasuyuki Arai

0756-7256

5184

31780 7590 02/08/2007

ERIC ROBINSON

PMB 955

21010 SOUTHBANK ST.

POTOMAC FALLS, VA 20165

EXAMINER

MATTHEWS, COLLEEN ANN

ART UNIT

PAPER NUMBER

2811

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
--	-----------	---------------

3 MONTHS

02/08/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No. 10/781,795	Applicant(s) ARAI ET AL.	
	Examiner Colleen A. Matthews	Art Unit 2811	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 01 November 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-27 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-27 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|--|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input checked="" type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. **Claims 1, 4-6 and 15-16** are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Pub. No. 2003/0032210 to Takayama et al (Takayama).
3. **Regarding claim 1**, Takayama discloses a semiconductor device comprising a thin film integrated circuit device (Figures 9A-9D), where the thin film integrated circuit comprises a substrate (412), an adhesive (411) over the substrate; a metal oxide (402; paragraph [0190] lines 1-3, paragraph [0242] lines 17-18, paragraph [0246] line 4) over the adhesive; an insulating film (403; paragraph [0191] lines 1, paragraph [0242] lines 19-20) over the metal oxide, a semiconductor film (104-108 in Figure 6A), a gate insulating film (118 in Figure 6B) and a gate electrode (Figure 6C elements 126-130), which are provided over the insulating film.
4. **Regarding claims 4 and 5**, Takayama discloses a semiconductor device according to claim 1, where the semiconductor film functions as an active region and as a channel region (paragraph [0217] and [0221])

Art Unit: 2811

5. **Regarding claim 6**, Takayama discloses an IC label comprising a thin film integrated circuit, where the thin film integrated circuit comprises a substrate (412), an adhesive (411) over the substrate; a metal oxide (402; paragraph [0190] lines 1-3, paragraph [0242] lines 17-18, paragraph [0246] line 4) over the adhesive; an insulating film (403; paragraph [0191] lines 1, paragraph [0242] lines 19-20) over the metal oxide, a semiconductor film (104-108 in Figure 6A), a gate insulating film (118 in Figure 6B) and a gate electrode (Figure 6C elements 126-130), which are provided over the insulating film.
6. **Regarding claim 15**, Takayama discloses a container comprising a thin film integrated circuit, where the thin film integrated circuit comprises a substrate (412), an adhesive (411) over the substrate; a metal oxide (402; paragraph [0190] lines 1-3, paragraph [0242] lines 17-18, paragraph [0246] line 4) over the adhesive; an insulating film (403; paragraph [0191] lines 1, paragraph [0242] lines 19-20) over the metal oxide, a semiconductor film (104-108 in Figure 6A), a gate insulating film (118 in Figure 6B) and a gate electrode (Figure 6C elements 126-130), which are provided over the insulating film.
7. **Regarding claim 16**, Takayama as modified discloses a container according to claim 15 as above. Takayama discloses where the thin film integrated circuit is covered by a label (407).

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. **Claims 2-3** are rejected under 35 U.S.C. 103(a) as being anticipated by U.S.

Pub. No. 2003/0032210 to Takayama et al (Takayama) in view of U.S. Pat. No.

6,703,267 to Tanabe et al (Tanabe).

10. **Regarding claims 2-3**, Takayama discloses a semiconductor device according to claim 1.

Takayama fails to disclose:

- the metal oxide as an oxide of an element selected from the group consisting of W, Ti, Ta, Mo, Nd, Ni, Co, Zr, Zn, Ru, Rh, Pd, Os, and Ir; an alloy containing the metal as a main component; or a chemical compound thereof or WO₂ or WO₃.

Tanabe teaches:

- a thin film integrated circuit device (Figure 11c) with the metal oxide as WO₂ or WO₃ (Column 3 line 24).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Takayama to have the metal oxide as WO₂ or WO₃ as in

Tanabe et al. in order to form a good interface between the metal oxide and the insulating layer.

11. **Claims 7-8 and 18-19** are rejected under 35 U.S.C. 103(a) as being anticipated by U.S. Pub. No. 2003/0032210 to Takayama in view of U.S. Pat. No 6,885,032 to Forbes et al. (Forbes).

12. **Regarding claims 7-8 and 18-19**, Takayama discloses an IC label and a container with a thin film integrated circuit as above in claims 6 and 15.

Takayama fails to disclose:

- the IC label as contactless
- where the surface can be printed with a character, a letter, text, a symbol, or a diagram.
- where the thin film integrated circuit is held between a first label and a second label film and the second label is affixed to the thin film integrated circuit with an adhesive agent
- and the metal oxide adhered to the container

Forbes teaches:

- an IC label (Figure 2c element 16') as a contactless type (column 2 lines 39-47)
- a surface of the IC label (Figure 1 element 16) can be printed with a character, a letter, text, a symbol, or a diagram (Figure 1 element 14 and column 2 line 9-12).

Art Unit: 2811

- the thin film integrated circuit (Figure 2a element 20) is held between a first label (Figure 2b elements 22 and 24) and a second label film (Figure 5 element 32), and the second label is affixed to the thin film integrated circuit with an adhesive agent (Figure 5 element 36).
- and the metal oxide adhered to the container (Figure 1 and column 5 lines 11-19).

It would have been obvious to one of ordinary skill in the art at the time the invention was made in order to allow the integrated circuit to be used for applications such as RFID tags.

13. **Claims 9-11, 20-21 and 23** are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Pub. No. 2003/0032210 to Takayama in view of U.S. Pat. No 6,885,032 to Forbes et al. in view of U.S. Pub. No. 2004/0256644 to Kugler et al.

14. **Regarding claims 9-11**, Takayama discloses an IC label comprising a thin film integrated circuit where the thin film integrated circuit comprises a substrate (412), an adhesive (411) over the substrate; a metal oxide (402; paragraph [0190] lines 1-3, paragraph [0242] lines 17-18, paragraph [0246] line 4) over the adhesive; an insulating film (403; paragraph [0191] lines 1, paragraph [0242] lines 19-20) over the metal oxide, a semiconductor film (104-108 in Figure 6A), a gate insulating film (118 in Figure 6B) and a gate electrode (Figure 6C elements 126-130), which are provided over the insulating film. Takayama also discloses use of the label with an antenna (2906 in Figure 19A and 3006 in Figure 19B).

Takayama fails to disclose:

- the IC label comprising a contactless thin film integrated circuit.
- the antenna in a same layer as the gate electrode.
- the antenna with the same material as the gate electrode.
- the antenna comprising a conductive paste.

Forbes teaches:

- an IC label (Figure 2 element 16') comprising a contactless thin film integrated circuit (column 2 lines 39-47).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Takayama to include a contactless thin film integrated circuit as in Forbes in order to allow the integrated circuit to be used for applications such as RFID tags.

Kugler et al. teaches:

- an antenna in the same layer as the gate electrode (page 7 paragraph 75 lines 6-7).
- the antenna formed from the same material as the gate electrode (page 2 paragraph 22 lines 5-8).
- the antenna comprising a conductive paste (page 7 paragraph 76 lines 3-5).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to add an antenna in the same layer as the gate electrode make the antenna with the same material as the gate electrode or a conductive paste to

Art Unit: 2811

Takayama in order to provide an identification device with an active antenna that can be deposited on a substrate with conventional printing methods.

15. **Regarding claims 20 and 23**, Takayama discloses a container comprising a thin film integrated circuit where the thin film integrated circuit comprises a substrate (412), an adhesive (411) over the substrate; a metal oxide (402; paragraph [0190] lines 1-3, paragraph [0242] lines 17-18, paragraph [0246] line 4) over the adhesive; an insulating film (403; paragraph [0191] lines 1, paragraph [0242] lines 19-20) over the metal oxide, a semiconductor film (104-108 in Figure 6A), a gate insulating film (118 in Figure 6B) and a gate electrode (Figure 6C elements 126-130), which are provided over the insulating film. Takayama also discloses use of the container with an antenna (2906 in Figure 19A and 3006 in Figure 19B).

Takayama fails to disclose:

- the container comprising a contactless thin film integrated circuit.
- an antenna provided in the same layer as the gate electrode.
- the thin film integrated circuit held between a first label and a second label and the second label is affixed to the thin film integrated circuit with an adhesive agent.

Forbes teaches:

- an IC label (Figure 2c element 16') as a contactless type (column 2 lines 39-47)
- the thin film integrated circuit (Figure 2a element 20) held between a first label (Figure 2b elements 22 and 24) and a second label (Figure 5

element 32), and the second label is affixed to the thin film integrated circuit with an adhesive agent (Figure 5 element 36).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Takayama to have a container comprising the contactless thin film integrated circuit adhered to the container as in Forbes in order to attach the IC to a products such as cell phones or RFID tags.

Kugler et al. teaches:

- an antenna in the same layer as the gate electrode (page 7 paragraph 75 lines 6-7).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to add an antenna in the same layer as the gate electrode to further modify Takayama in order to provide an identification device with an active antenna that can be deposited on a substrate with conventional printing methods.

16. **Regarding claim 21**, Takayama as modified discloses a container according to claim 20 as above. Takayama discloses where the thin film integrated circuit is covered by a label (407).

17. **Claims 12** is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Pub. No. 2003/0032210 to Takayama in view of U.S. Pat. No. 6,885,032 to Forbes et al. in further view of U.S. Pat. No. 6,878,643 to Krulevitch et al.

18. **Regarding claim 12**, Takayama discloses an IC label comprising a thin film integrated circuit where the thin film integrated circuit comprises a substrate (412), an

Art Unit: 2811

adhesive (411) over the substrate; a metal oxide (402; paragraph [0190] lines 1-3, paragraph [0242] lines 17-18, paragraph [0246] line 4) over the adhesive; an insulating film (403; paragraph [0191] lines 1, paragraph [0242] lines 19-20) over the metal oxide, a semiconductor film (104-108 in Figure 6A), a gate insulating film (118 in Figure 6B) and a gate electrode (Figure 6C elements 126-130), which are provided over the insulating film and a wiring (Figure 8 elements 157-165) connected to an impurity region of the semiconductor film. Takayama also discloses use of the label with an antenna (2906 in Figure 19A and 3006 in Figure 19B).

Takayama fails to disclose:

- the IC label comprising a contactless thin film integrated circuit.
- the antenna in a same layer as the wiring

Forbes teaches:

- an IC label (Figure 2 element 16') comprising a contactless thin film integrated circuit (column 2 lines 39-47).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Takayama to include a contactless thin film integrated circuit as in Forbes in order to allow the integrated circuit to be used for applications such as RFID tags.

Krulevitch et al. teaches:

- an antenna (Figure 11 element 1104) in the same layer as the wiring (Figure 11 element 1106).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to add to Takayama the antenna in the same layer as the wiring in order to facilitate communication with a remote receiver.

19. **Regarding claims 24 and 27**, Takayama discloses a container comprising a thin film integrated circuit where the thin film integrated circuit comprises a substrate (412), an adhesive (411) over the substrate; a metal oxide (402; paragraph [0190] lines 1-3, paragraph [0242] lines 17-18, paragraph [0246] line 4) over the adhesive; an insulating film (403; paragraph [0191] lines 1, paragraph [0242] lines 19-20) over the metal oxide, a semiconductor film (104-108 in Figure 6A), a gate insulating film (118 in Figure 6B) and a gate electrode (Figure 6C elements 126-130), which are provided over the insulating film and a wiring (Figure 8 elements 157-165) provided over the semiconductor film. Takayama also discloses use of the label with an antenna (2906 in Figure 19A and 3006 in Figure 19B).

Takayama fails to disclose:

- the container comprising a contactless thin film integrated circuit.
- the antenna in a same layer as the wiring
- the thin film integrated circuit held between a first label and a second label and the second label is affixed to the thin film integrated circuit with an adhesive agent.

Forbes teaches:

- a container (Figure 2 element 16') comprising a contactless thin film integrated circuit (column 2 lines 39-47).

- the thin film integrated circuit (Figure 2a element 20) held between a first label (Figure 2b elements 22 and 24) and a second label (Figure 5 element 32), and the second label is affixed to the thin film integrated circuit with an adhesive agent (Figure 5 element 36)

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Takayama to include a contactless thin film integrated circuit as in Forbes in order to allow the integrated circuit to be used for applications such as RFID tags.

Krulevitch et al. teaches:

- an antenna (Figure 11 element 1104) in the same layer as the wiring (Figure 11 element 1106).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to add to Takayama the antenna in the same layer as the wiring in order to facilitate communication with a remote receiver.

20. **Regarding claims 25**, Takayama modified discloses the container according to claim 24. Takayama discloses where the thin film integrated circuit is covered by a label (407).

21. **Claims 13 and 14** are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Pub. No. 2003/0032210 to Takayama in view of U.S. Pat. No 6,885,032 to Forbes et al. and U.S. Pat. No. 6,878,643 to Krulevitch et al in further view of U.S. Pub. No. 2004/0256644 to Kugler et al.

Art Unit: 2811

22. **Regarding claims 13-14**, Takayama as modified teach an IC label according to claim 12 as outlined above.

Takayama fails to disclose:

- the antenna comprises a same material as the wiring.
- the antenna comprising a conductive paste

Kugler et al. teaches:

- an antenna made from a metal (column 5 paragraph 56 lines 1-3).
- an antenna made from a conductive paste (page 7 paragraph 76 lines 3-5).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to further modify Takayama by making the antenna from a metal that is the same as the metal wiring or from a conductive paste as in Kuger in order to further simplify production of the device by ordinary printing methods.

23. **Claim 17** is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Pub. No. 2003/0032210 to Takayama in view of U.S. Pub. No. 2002/0027247 to Arao et al.

24. **Regarding claim 17**, Takayama discloses a container according to claim 16 as outlined above.

Takayama fails to disclose:

- the protective film having a DLC or CN film

Arao et al. teaches:

- a protective film of DLC (Figure 10B element 704) provided on a thin film integrate circuit.

It would have been obvious to one of ordinary skill in the art at the time the invention was made use the DLC film of Arao et al. as the protection layer in Takayama in order to prevent the invasion of oxygen as well as water and also to mechanically protect the thin film integrated circuit.

25. **Claim 22** is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Pub. No. 2003/0032210 to Takayama in view of U.S. Pat. No 6,885,032 to Forbes et al. (Forbes) and of U.S. Pub. No. 2004/0256644 to Kugler et al (Kugler) in further view of U.S. Pub. No. 2002/0027247 to Arao et al (Arao).

26. **Regarding claim 22**, Takayama as modified teaches a container according to claim 20 as outlined above.

Takayama fails to disclose:

- the protective film having a DLC or CN film

Arao et al. teaches:

- a protective film of DLC (Figure 10B element 704) provided on a thin film integrate circuit.

It would have been obvious to one of ordinary skill in the art at the time the invention was made use the DLC film of Arao et al. as the protection layer in Takayama in order to prevent the invasion of oxygen as well as water and also to mechanically protect the thin film integrated circuit.

27. **Claim 26** is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Pub. No. 2003/0032210 to Takayama in view of U.S. Pat. No 6,885,032 to Forbes et al. and U.S. Pat. No. 6,878,643 to Krulevitch et al in further view of U.S. Pub. No. 2002/0027247 to Arao et al.

28. **Regarding claim 26**, Takayama as modified teaches a container according to claim 24 as outlined above.

Takayama fails to disclose:

- the protective film having a DLC or CN film

Arao et al. teaches:

- a protective film of DLC (Figure 10B element 704) provided on a thin film integrate circuit.

It would have been obvious to one of ordinary skill in the art at the time the invention was made use the DLC film of Arao et al. as the protection layer in Takayama in order to prevent the invasion of oxygen as well as water and also to mechanically protect the thin film integrated circuit.

Response to Arguments

Applicant's arguments filed 11/01/2006 with respect to the Krulevitch reference for claims 12 and 24 (page 9 last paragraph and page 10 first paragraph) are not persuasive. Krulevitch discloses in Figure 11 a wiring (1106, "metal traces") an antenna (1104) both in the same layer (1101).

Applicant's remaining arguments with respect to claims 1-27 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Colleen A. Matthews whose telephone number is 571-272-1667. The examiner can normally be reached on Monday - Friday 8AM-4:30PM.

Art Unit: 2811

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Eddie Lee can be reached on 571-272-1732. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

CAM
02/05/2007


Sara Crane
Primary Examiner